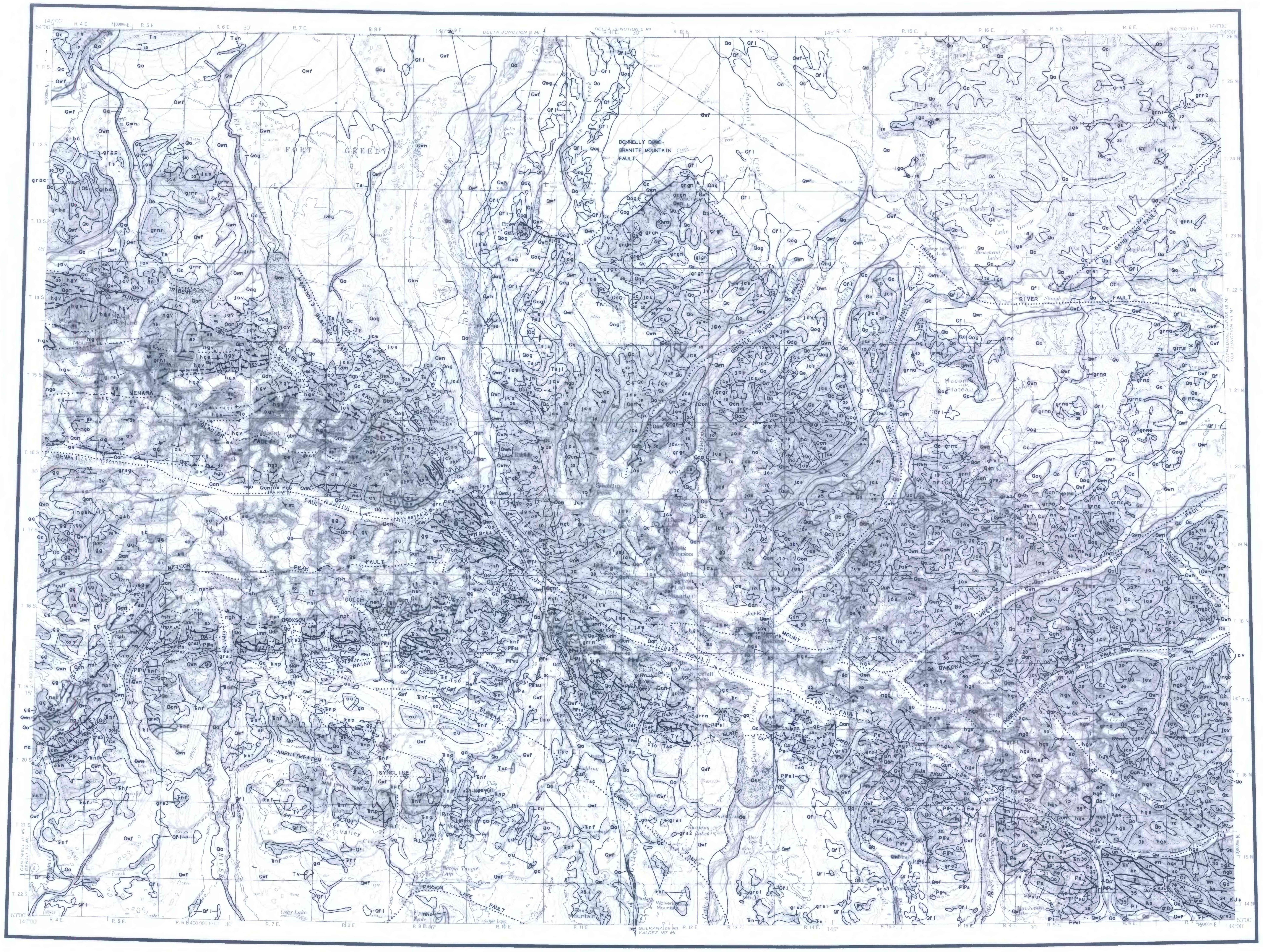
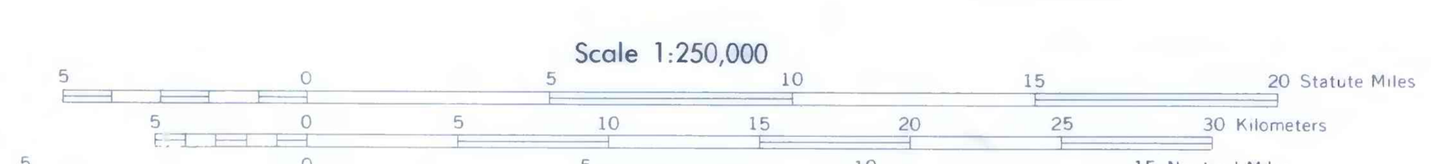
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

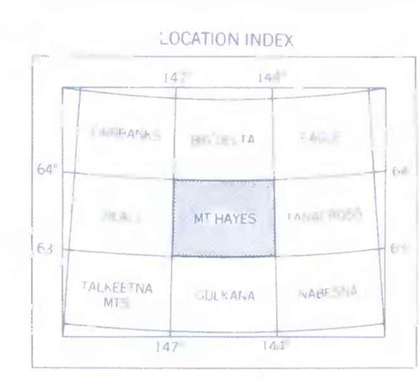
OPEN-FILE MAP
92-594
Explanatory pamphlet accompanies map



Base from U.S. Geological Survey 1:250,000 topo series:
Mount Hayes, 1955, ALASKA-CANADA.
Universal Transverse Mercator projection

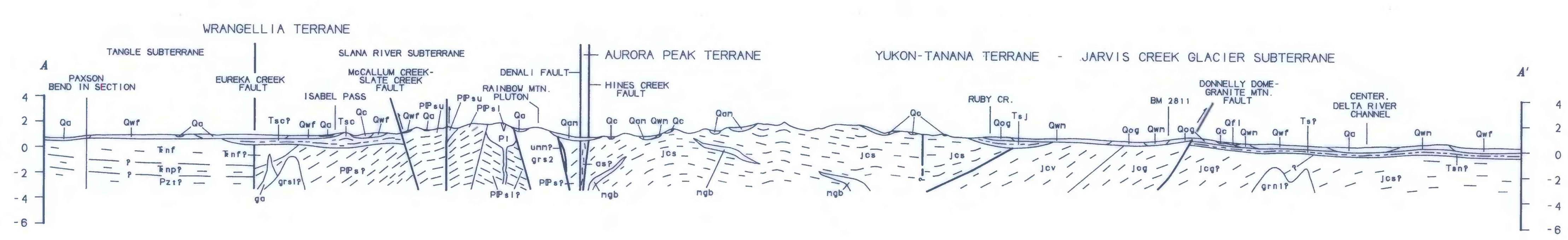


CONTOUR INTERVAL 200 FEET IN THE UNITED STATES AND 500 FEET IN CANADA
DATUM IS MEAN SEA LEVEL



[GEOLOGIC CREDIT NOTE]

Geology mapped by N.R.D. Albert, 1978, J.N. Aleinikoff, 1980, G.C. Bond, 1962-64, 1966-72, P.L. Herzon, 1979, I.M. Lange, 1979-83, 1985-87, Ronny T. Miyaoka, 1979-81, W.H. Nelson, 1979, W.J. Nokleberg, 1978-83, 1985-87; D.H. Richter, 1966-67, 1972-74, 1979, C.E. Schwab, 1980-82, T.E. Smith, 1964, 1968-71, J.E. Stout, 1964, 1971, 1973, Warren Yeend, 1979-80, R.E. Zehner, 1979-83.



PRELIMINARY GEOLOGIC MAP OF THE MOUNT HAYES QUADRANGLE, EASTERN ALASKA RANGE, ALASKA

By

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1992

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CORRELATION OF MAP UNITS

SURFICIAL DEPOSITS

ALLUVIUM AND COLLUVIUM

- Qa, Qfl, Qc — Holocene — QUATERNARY

GLACIAL DEPOSITS

- Qam — Holocene
- Qwm, Qwf — Holocene and Pleistocene
- Qog — Pleistocene

(QUATERNARY)

Unconformity

SEDIMENTARY ROCKS AND METAMORPHOSED SEDIMENTARY, VOLCANIC, AND PLUTONIC ROCKS
North of Denali fault

TERTIARY SEDIMENTARY ROCKS

- Tn — Pliocene
- Ts — Pliocene, Miocene and Oligocene
- Tsj (Tsju, Tsjm, Tsjl) — Early Tertiary

(TERTIARY)

Unconformity

ALKALIC MAFIC AND ASSOCIATED PLUTONIC ROCKS

- la, md — Early Tertiary and Late Cretaceous — TERTIARY AND CRETACEOUS

GRANITIC PLUTONIC ROCKS NORTH OF DENALI FAULT

GRANITIC ROCKS

- grn 1, grn2, grn3 — Early Tertiary or Late Cretaceous — TERTIARY OR CRETACEOUS
- grgr — Early Tertiary — TERTIARY (?)
- grbc, grmh — Early Tertiary or Late Cretaceous — TERTIARY OR CRETACEOUS
- grmr, grgm — Late Cretaceous — CRETACEOUS
- grma — Late to Early Cretaceous — CRETACEOUS

Intrusive contact

MAFIC PLUTONIC ROCKS

- mgb — CRETACEOUS
- gbm — CRETACEOUS(?)

SOUTHERN YUKON-TANANA TERRANE

LAKE GEORGE SUBTERRANE
NORTH OF TANANA RIVER FAULT

- lga — MISSISSIPPIAN
- lgr — DEVONIAN

Intrusive contact

- lgs — DEVONIAN AND OLDER

MACOMB SUBTERRANE
SOUTH OF TANANA RIVER FAULT AND NORTH OF ELTING CREEK FAULT

- mg — DEVONIAN

Intrusive contact

- ms — DEVONIAN OR OLDER

JARVIS CREEK GLACIER SUBTERRANE
SOUTH OF ELTING CREEK FAULT AND
NORTH OF HINES CREEK AND MOUNT GAKONA FAULTS

- jcg — DEVONIAN

Intrusive contact

- jcv — DEVONIAN
- jcs — DEVONIAN AND OLDER

HAYES GLACIER SUBTERRANE
SOUTH OF HINES CREEK AND MOUNT GAKONA FAULTS AND
NORTH OF NENANA GLACIER AND DENALI FAULTS

- hgv — DEVONIAN
- hgs — DEVONIAN AND OLDER

AURORA PEAK TERRANE
SOUTH OF NENANA GLACIER FAULT AND NORTH OF DENALI FAULT

- ag — Late to mid-Cretaceous — CRETACEOUS
- as — TRIASSIC TO SILURIAN

WINDY TERRANE
WITHIN SPLAYS OF DENALI FAULT

- wm — CRETACEOUS, DEVONIAN, AND SILURIAN (?)

Denali fault

SEDIMENTARY AND VOLCANIC ROCKS AND METAMORPHOSED SEDIMENTARY, VOLCANIC, AND PLUTONIC ROCKS
South of Denali fault

TERTIARY SEDIMENTARY AND VOLCANIC ROCKS

- Tsc — Miocene to Eocene
- Tc — Eocene(?)
- Tv — Eocene

(TERTIARY)

Unconformity

GRANITIC PLUTONIC ROCKS SOUTH OF THE DENALI FAULT

- grs1, grs2, grs3 — Cretaceous and Late Jurassic — CRETACEOUS AND LATE JURASSIC
- grsg — Early Tertiary — TERTIARY
- grcl — Early Cretaceous or Late Jurassic? — CRETACEOUS OR JURASSIC?
- grrn — Cretaceous and (or) Mississippian — CRETACEOUS AND (OR) MISSISSIPPIAN

TERRANE OF ULTRAMAFIC AND ASSOCIATED ROCKS WITHIN BRANCHES OF DENALI FAULT

- um — PALEOZOIC(?)

Splay of Denali fault

MACLAREN TERRANE
SOUTH OF DENALI FAULT AND NORTH OF BROXSON GULCH THRUST

EAST SUSITNA BATHOLITH AND SCHIST, QUARTZITE, AND AMPHIBOLITE
SOUTH OF DENALI FAULT AND NORTH OF METEOR PEAK FAULT

- gg — Early Tertiary, and Late Cretaceous — TERTIARY AND CRETACEOUS
- sa — Late Cretaceous or older — CRETACEOUS OR OLDER
- mig, mgsh — CRETACEOUS (?)
- sq — TRIASSIC(?)

MACLAREN GLACIER METAMORPHIC BELT
SOUTH OF METEOR PEAK FAULT AND NORTH OF BROXSON GULCH THRUST

- msh, mph, ma — Late Jurassic or older — JURASSIC OR OLDER

CLEARWATER TERRANE
WITHIN BRANCHES OF BROXSON GULCH THRUST

- csv — Late Triassic — TRIASSIC

WRANGELLIA TERRANE
WITHIN BRANCHES OF BROXSON GULCH THRUST

- umm — CRETACEOUS TO TRIASSIC(?)

SOUTH OF BROXSON GULCH THRUST AND DENALI FAULT AND
NORTH OF PAXSON LAKE FAULT

- JTRm — Early Jurassic and Late Triassic — JURASSIC AND TRIASSIC

Splay of Broxson Gulch thrust

GABBRO, DIABASE, AND METAGABBRO AND CUMULATE MAFIC AND ULTRAMAFIC ROCKS

- ga, cu — Late Triassic (?) — TRIASSIC(?)

Intrusive contact

SLANA RIVER SUBTERRANE
SOUTH OF BROXSON GULCH THRUST AND DENALI FAULT AND
NORTH OF EUREKA CREEK FAULT

- KJs — Early Cretaceous and Late Jurassic — CRETACEOUS AND JURASSIC
- TRi, TRn — Late Triassic — TRIASSIC

Disconformity

- Pe — Early Permian — PERMIAN (?)
- Pi — Early Permian (?) — PERMIAN (?)

Intrusive contact

- PPs (PPsu, PPsl) — PERMIAN AND PENNSYLVANIAN

Intrusive contact

- Pt — PENNSYLVANIAN
- Pg — PENNSYLVANIAN

TANGLE SUBTERRANE
SOUTH OF EUREKA CREEK FAULT AND NORTH OF PAXSON LAKE FAULT

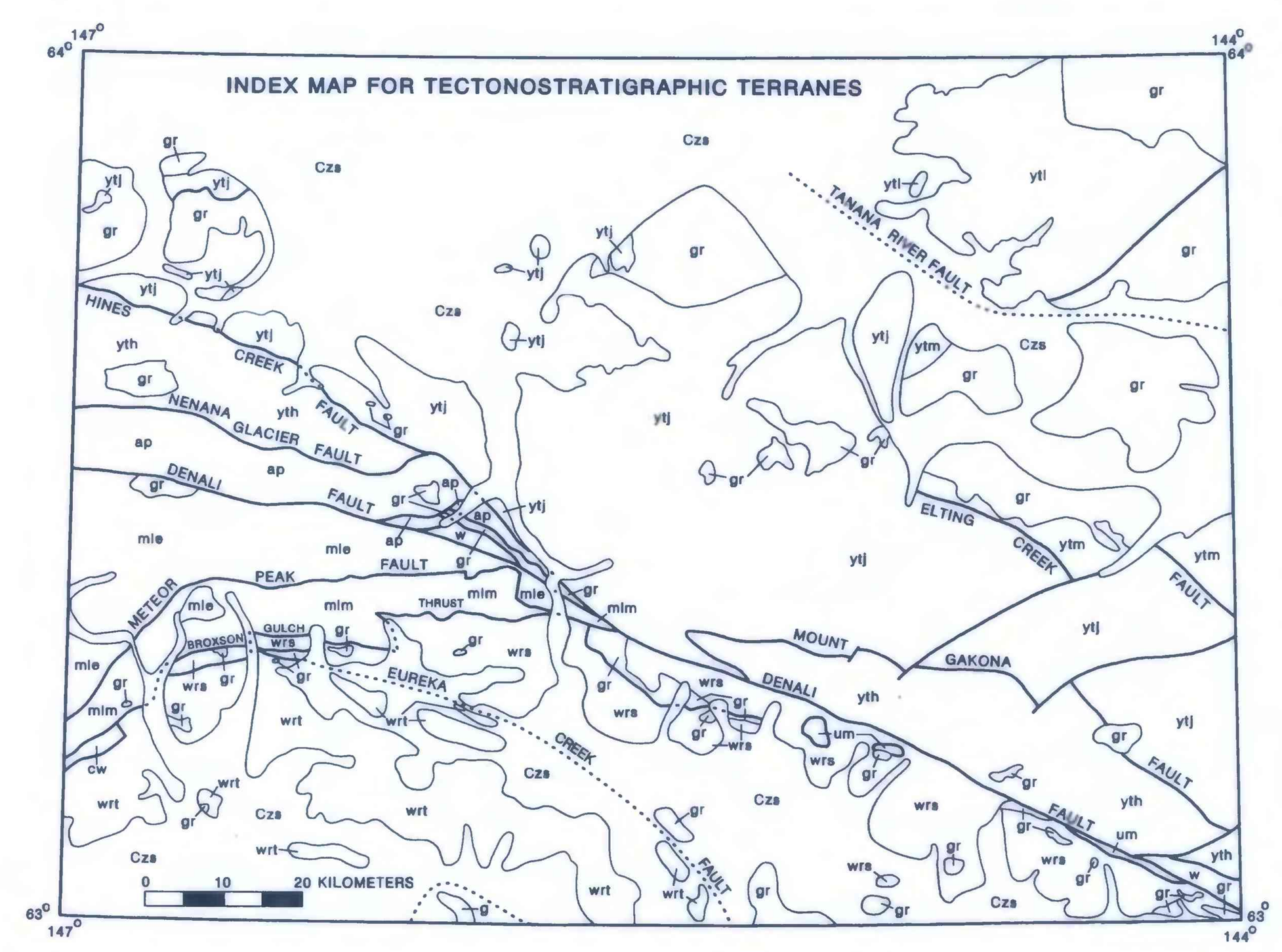
- TRi, TRnf, TRnp — Late Triassic — TRIASSIC

Disconformity

- Pzt — Late Paleozoic — PALEOZOIC

GULKANA RIVER TERRANE

- mha — Late Paleozoic(?) — PALEOZOIC



EXPLANATION TO INDEX MAP

- Czs — Cenozoic sedimentary and volcanic rocks — CENOZOIC

Unconformity

- gr — Granitic to gabbroic plutons, non-foliated — TERTIARY AND MESOZOIC

Intrusive contact

YUKON-TANANA TERRANE

- ytl, ytm, ytj, yth — MISSISSIPPIAN AND OLDER
  - ytl, Lake George subterrane
  - ytm, Macomb subterrane
  - ytj, Jarvis Creek Glacier subterrane
  - yth, Hayes Glacier subterrane

Nenana Glacier fault

AURORA PEAK TERRANE

- ap — CRETACEOUS TO SILURIAN

Splay of Denali fault

WINDY TERRANE

- w — CRETACEOUS, DEVONIAN AND SILURIAN(?)

Splay of Denali fault

TERRANE OF ULTRAMAMAFIC AND ASSOCIATED ROCKS

- um — PALEOZOIC(?)

MACLAREN TERRANE

- mle — East Susitna batholith — EARLY TERTIARY AND OLDER

Faulted intrusive contact

- mlm — Maclaren Glacier metamorphic belt — LATE JURASSIC OR OLDER

Splay of Broxson Gulch thrust

CLEARWATER TERRANE

- cw — LATE TRIASSIC

Splay of Broxson Gulch thrust

WRANGELLIA TERRANE

- wrs, wrt — JURASSIC TO LATE PALEOZOIC
  - wrs, Slana River subterrane
  - wrt, Tangle subterrane

Paxson Lake fault

GULKANA RIVER TERRANE

- g — LATE PALEOZOIC

Contact
Fault - dotted where concealed under surficial sedimentary deposits

GEOLOGIC MAP SYMBOLS

Contact--Dotted where concealed

Fault--Dashed where approximately located; dotted where concealed

Thrust or reverse fault--Dashed where approximately located; dotted where concealed; sawteeth on upper plate; teeth indicate dip direction of fault

Anticline or antiform--Showing direction of plunge; dashed where approximately located; dotted where concealed

Overturned antiform--Showing direction of dip of limbs

Syncline or synform--Showing direction of plunge; dashed where approximately located; dotted where concealed

Strike and dip of beds
- Inclined
- Vertical

Strike and dip of schistosity and parallel compositional layering
- Inclined
- Vertical